

Amendments to the Specification

Please replace the paragraph beginning at page 1, line 11, with the following replacement paragraph:

In conventional television broadcasting system, the electric wave is transmitted by analog modulation of the audio and/or video signals, a viewer can watch the broadcasting program by which a receiver demodulates the signals. In digital broadcasting system, audio and video signals are digitally modulated. Further, the digital broadcasting system transmits to a viewer various data of the program together with video and audio data. The viewer can get various information while watching the program. Herein, the information transmitted together with the program is defined as "contents" and the contents can be variously formed depending on the program. ~~While, according to a digital broadcasting system, which transmits the audio and/or video signals that are modulated in digital, since the video and audio as well as various data of the program can be transmitted to a viewer, the viewer can get the various information for the program while watching the program. Here, the information provided with the program is defined as contents in the present invention and the contents can be variously formed according to the program.~~

Please replace the paragraph beginning at page 1, line 20, with the following replacement paragraph:

In order to provide various contents together with the audio and video data, the broadcasting station should perform systematic maintenance and management of the contents. Further, the broadcasting station should search the ones corresponding to a specific program from a number of the contents. This is a difficult process. However, ~~since the broadcasting station, which should provide the contents, must prepare to transmit the various contents by adding the information into the audio and the video data, it is required a lot of time and workmen for maintenance and management of the contents. Moreover, it should be accompanied the difficulty for searching contents to be necessary to a specification program among great many contents.~~

Please replace the paragraph beginning at page 2, line 11, with the following replacement paragraph:

Therefore, the present invention is made to overcome the problems of the prior art. An it is an object of the present invention is to provide a method of efficiently and systemically managing the contents to be provided together with a program.

Please replace the paragraph beginning at page 3, line 21, with the following replacement paragraph:

A broadcasting program provider performs storage, maintenance and management of a lot of contents that are now produced in a exponential volume with the smooth progress of digital broadcasting. Hardware and software for transmission of the contents data should be organized to achieve mutual cooperation. At this time, a lot of time and man power are required to recognize composition of all the contents and define necessary encoding method or quantity of the contents to be used every time. Also, the contents should be well organized to be processed within a transmission system. To solve these problems, the present invention collects the contents in the form of an application. A provider of the broadcasting program should run processing for storage and maintenance and management of a lot of the contents that can be produced exponentially according to the broadcasting program for smooth progress of digital broadcasting, hardware and software for transmission of data must be performed mutually organically. At this time, a lot of time and man power are required to recognize composition of all the contents and define necessary encoding method or quantity of the contents to be used every time. Also, information for each the contents should be maintained for exchanging each other consistently within a transmission system. According to the present invention, to solve these problems, the present invention collects the related contents to each other data in the form of application.

Please replace the paragraph beginning at page 5, line 6, with the following replacement paragraph:

In this step, name and characteristics of the respective contents to be contained in the broadcasting program are defined. According to the method of the present invention,

the design for the management and administration of the contents for broadcasting is more convenient through the Application definition file (Application Definition File, hereinafter referring to an ADF) that have information about name of the contents and various characteristics. Since the ADF is a kind of a program, a programmer may make out the ADF by selecting a desirable programming language. However, in order to achieve efficient management of the application for digital broadcasting, design program ~~so that can efficiently manage the application for digital broadcasting,~~ the ADF according to the present invention defines following characteristics.

Please replace the paragraph beginning at page 6, line 4, with the following replacement paragraph:

Since two or more applications may be included in a ~~the application may be at least one in the~~ broadcasting program as described ~~deseried~~ above, it needs to define the name of the application. Therefore, in order to distinguish the respective applications, the name of the application is defined.

Please replace the paragraph beginning at page 6, line 8, with the following replacement paragraph:

The application is executed by a peripheral hardware and software in use when the application is executed in the transmission system for digital broadcasting. Therefore, the executing ~~execute~~ environment of the application should have a mutual compatibility with the hardware and software in use, the environment of the hardware and software where the application is executed is defined.

Please replace the paragraph beginning at page 7, line 4, with the following replacement paragraph:

In digital broadcasting, between the transport stream and the viewer's digital television that receives the transmitted transport stream, there is ~~are~~ a protocol as a rule for the transmission of data and exchange thereof. The protocol is applied to the application when the application is transmitted consecutively. In this portion, a method to transmit the application's data to viewer repeatedly using the protocol is defined.

Please replace the paragraph beginning at page 7, line 9, with the following replacement paragraph:

6) Portion of defining application's own information ~~itself information of application~~

Please replace the paragraph beginning at page 7, line 17, with the following replacement paragraph:

The server is a system that stores the application and the ADF and manages the application according to loaded information by loading information about the application and processing commands. For this, the server has a predetermined storing space and many modules that process ~~processes~~ the application. The ADF may be inputted to the server automatically by using the transmission protocol (TCP/IP SOCKET, FTP, BIOP etc.) from outside, or directly by a user with a recording medium such as a diskette or a compact disk. The input method can be divided into as following in accordance with engagement of the application that the ADF defines.

Please replace the paragraph beginning at page 8, line 11, with the following replacement paragraph:

Application that is inputted to the server is reconstructed, after reading the ADF, under control of a main controller that is necessary to data broadcasting in accordance with a schedule of the broadcasting program. That is, while managing the broadcasting schedule of whole programs, the main controller loads the ADF from the server at starting time when the application in the server is broadcasted Based on the loaded ADF, the main controller delivers, to an encoding section described in the following, a command to encode the application, and to a system information generating section described in the following, a command to generate system information necessary for the broadcasting of the application. At this time, both of the information delivered to the data encoding section and the system information generating section is made based on the information of the ADF. In the information delivered, information on the applications to be encoded, information on the encoding method for the applications, and the information

required for a receiving section of the digital data (for example, a television set for receiving the digital data) to receive the transmitted applications are included. A system manager who transmits the data for the digital broadcasting produces and inputs the ADF into the server, and the server manages the applications containing the contents by interpreting the ADF to achieve mutual cooperation of whole transmission system.

~~Application that is inputted to server is reconstructed by a main controller described after by reading the ADF that is necessary to data broadcasting in accordance with a schedule of the broadcasting program. That is, while managing the broadcasting schedule of whole programs, the main controller loads the ADF from the server at starting time when the application in the server is transmitted together with the broadcasting. Based on the loaded ADF, the main controller gives to an encoding section described after a command to encode the application, and to a system information generating section described after information that commands to generate system information necessary to which the application is broadcasted. At this time, both of the information transmitted to the data encoding section and the system information generating section is made based on the information of the ADF, contents of the information are information about the applications to be encoded and the encoding method for transmitting the applications and the information which a receive section of the digital data (for example, a television set for receiving the digital data) requires to receive the transmitted applications. A system manager who transmits the data for the digital broadcasting produces and inputs the ADF into the server, makes the server manage the applications containing the contents by interpreting the ADF, then whole transmission system can be operated organically.~~

Please replace the paragraph beginning at page 9, line 7, with the following replacement paragraph:

According to the present invention, the various contents for the digital broadcasting can be efficiently managed. The processed application in accordance with the ADF in the server undergoes data encoding defined in the transmission standard for the digital broadcasting, which is specifically illustrated in the following. The application processed is encoded in accordance with the transmission standard, and a data stream

having a predetermined format is generated. The encoded application is made to a transport stream as a final form to be transmitted to the viewer. The transport stream is converted to the electric wave while passing through a digital modulating circuit and a radio transmission circuit, and finally transmitted through an antenna. The viewer can enjoy the variety of the contents received together with the program and displayed on a screen of the television set of the viewer.

~~According to the present invention, the various contents for the digital broadcasting can be efficiently managed, after this the processed application in accordance with the ADF in the server undergoes data encoding that the application is encoded by the defined way of the transmission standard for the digital broadcasting as described above as follow. That is, in the process, by coding the application defined in accordance with the transmission standard by encoding, a data stream having a predetermined format is generated, and the encoded application is made to a transport stream as a final form to be transmitted to the viewer. The transport stream is converted to the electric wave while passing through a digital modulating circuit and a radio transmission circuit, and finally transmitted through an antenna. The viewer can enjoy the variety of the contents received together with the program by which the data stream is displayed on a screen of the television set of the viewer.~~

Please replace the paragraph beginning at page 9, line 19, with the following replacement paragraph:

FIG. 2 is a view showing an example for illustrating an application definition file according to the present invention. In this embodiment, the ADF is described by using XML language. The XML (eXtensible Markup Language), which is a language that was used to display a document file or a multimedia file on a browser in Internet and to efficiently exchange the files. The XML language provides more systemic and consistent access way than HTML (Hyper Text Markup Language) that is utilized widely in World Wide Web. Moreover, HTML has a fixed TAG that is used as a mark for describing contents to be performed on the browser, while the XML allows to a designer to voluntary make the TAG. The extensivity of the XML is superior. The XML language has a DTD (Document Type Definition) frame, and the file expressed by the XML is

produced in procedures of constructing a structure of the DTD and defining the contents to be contained in the structure. The DTD acts as a frame that preset elements such as name, form, and expression way of the respective XML files. FIG. 2 shows an example that illustrates the DTD for designing an ADF according to the present invention.

~~displays a document file or a multimedia file on a browser in Internet and for efficiently performing the exchange of the files, is a language which can structurally design that can define more systematic and consistent access way than HTML (Hyper Text Markup Language) that is utilized widely in World Wide Web. Moreover, since a TAG used as a mark for describing contents to be performed on the browser is fixed in the HTML, while the XHTML allows to a designer to voluntarily make the TAG, the extensivity of the XHTML is superior. The XML language has a kind of frame of a DTD (Document Type Definition), the file expressed by the XML is produced according to the structure of the DTD after the DTD that structurally expresses the contents to be contained in the file. The DTD acts role as a frame that preset elements such as name, form, and expression way of the respective XML files, and FIG. 2 is an example that illustrates DTD for designing an ADF according to the present invention.~~

The structure is described below by referring to the figures. The ADF file consists of greatly 3 parts of a part 201, which defines a type of an application, a part 202, which defines components of the corresponding application, and a part 203 to 212, which defines contents of the components. In the part 201, what category each application is included is defined. Here, DASE application that defines DASE application of ATSC of United States of America standard and SEC application to be defined by being included in specific company's category appear as simple examples. This part is defined additionally by new standard in the future. In the part 202, the components necessary to set each component of the application are defined. Parts of the part 203 to 212 in accordance with the values which are defined in the part 202 is defined, and necessary values thereof are defined. In the part 203, an application ID to be defined in order to classify an application is defined. In the part 204, the name of the application, which is an element of the application ID, is defined. Structural information related to the application is defined. In this part, defined whether the application is automatically started or not, and a position on a screen which the application is executed and size thereof. The parts 206, 209, 210 are parts that encoding method corresponding to

the respective data module is defined. 206 is a part for illustrating a data transmitting method according to the DataCarousel by using a download protocol of DSM-CC. The DSM-CC (Digital Storage Media Command and Control) is a kind of protocol for a digital broadcasting, and the DataCarousel is a scenario that pre-sets a method for continuously transmitting data of the application to the viewer. That is, a transmitting order of the several applications contained in a broadcasting program is determined in advance. When the viewer downloads the data in accordance with the method of the part 206, a download ID, a data rate, and a data size are designated. Moreover, the respective data, modules that are an aggregate of a unit data stream to be inserted into the DataCarousel, can include at least one unit data stream according to the definition of the data module in the part 207. In addition, the name, a divider which divides the data module, has a structure of a NameModule, and the aspect is identical as shown in the part 208. In the par 209, it is illustrated an encoding method of designating an Asynchronous IP data stream. As shown in FIG. 2, encoding method of tap id, device id, data rate, destination IP address, and destination IP port is designated. In the part 210, data module of the id stream to be arrived in corresponding time is illustrated, and the arrived time of the corresponding data is designated as an offset time. Moreover, it is illustrated that the data name is consisted of the structure of the AIPComponentName which is illustrated in the part 211. In the part 212, the definitions in the parts 203 to 211 are utilized for new application, or new item can be added by defining the new item.